

Claims:

1. An apparatus for supporting semiconductor wafer in a wafer processing system, the apparatus comprising:

- 5 (a) at least two wafer support assemblies defining at least two wafer support levels, respectively, the wafer support assemblies being mounted between opposing support beams;
- (b) one or more supporting bases connected to or integral with each of the wafer support assemblies; and
- 10 (c) a motion unit coupled to the support beams.

2. The apparatus of claim 1 wherein each of the wafer support assemblies comprises the two support bases, which are mounted on the respective support beam.

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3. The apparatus of claim 1 comprising at least one additional pair of opposing support beams associated with at least one additional wafer support assembly defining at least one additional wafer support level, the pairs of support beams being accommodated in a vertical alignment with each other, each pair of the support beams being coupled to its motion unit.

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4. The apparatus of claim 3 wherein the motion unit comprises a linear driver.

25 5. An apparatus for processing semiconductor wafers, comprising:

- (a) a wafer processing station selected from the following: chemical-mechanical polisher, phototrack, exposure tool, etching equipment, physical vapor deposition tool, and chemical vapor deposition tool; and comprising a robot for moving the wafer between the processing and measuring stations
- 30 (b) a wafer monitoring station in communication with the processing station;
- (c) a buffer station disposed at least partially above said wafer monitoring station, the buffer station comprising:

- at least two wafer support assemblies defining at least two wafer support levels, respectively, the wafer support assemblies being mounted between opposing support beams;
- one or more supporting bases connected to or integral with the wafer support assemblies; and
- a motion unit connected to the support beams.

6. The apparatus of claim 5 wherein the wafer support assemblies comprise two support bases, which are mounted onto the support beam.

7. The apparatus of claim 5 wherein the wafer support assemblies comprise two support bases, each support base being mounted to the respective support beam.

8. The apparatus of claim 5 comprising at least one additional pair of opposing support beams associated with at least two additional wafer support assemblies, the pairs of support beams being accommodated in a vertical alignment with each other, each pair of the support beams being connected to its motion unit.

9. The apparatus of claim 8 wherein the motion unit comprises a linear driver.

10. A wafer polishing apparatus comprising:

- a) a wafer processing system having a chemical mechanical polishing system and a robot to transfer wafers into and out of the polishing system;
- b) a wafer monitoring device disposed adjacent the polishing system;
- c) a buffer station disposed at least partially above the wafer monitoring device, the buffer station comprising two or more pairs of wafer support assemblies, defining two or more wafer support levels, respectively, coupled to a motion unit.

11. The apparatus of claim 9 wherein the motion unit is operable to move two wafer support beams towards or away from each other, the support beams carrying said support assemblies each having a pair of wafer support bases.

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12. The apparatus of claim 10 comprising an additional robot to transfer wafer to and from the buffer station.

13. The apparatus of claim 11 wherein the motion unit is operable to
10 provide a linear movement of each pair of the wafer support bases into at least a wafer receiving position and a wafer pass through position.

14. The apparatus of claim 13 wherein the wafer support bases are coupled to the support beams which are cantilever mounted to said one or
15 more support bases.

15. A wafer polishing system comprising:
a polishing station for polishing a face of a wafer;
an inspection station for inspecting a polished wafer and for determining a
20 condition of said polished wafer; and
a robotic mechanism which transfers polished wafers between said polishing station and said inspection station, a buffer station including at least two wafer supporting assemblies defining at least two wafer support levels, respectively, first and second robots, said first robot being adapted
25 to transfer a polished wafer between said polishing station and said wafer supporting assemblies, and said second robot being adapted to transfer a polished wafer between said wafer supporting assemblies and said inspection station, wherein a polished wafer requiring inspection may be placed onto the first wafer supporting assembly by the first robot and an
30 inspected wafer may be placed onto the second wafer supporting assembly by the second robot.